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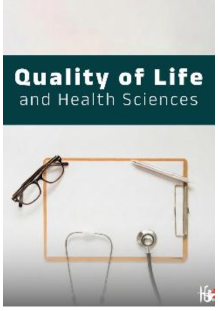

Perceived Determinants of Quality of Life Among Women With Breast Cancer After Radiotherapy: A Qualitative Content Analysis

Seyed Amir. Saadati[1*], Nadereh. Saadati[2], Abbie. Wilson[3], Karina. Batthyany[4]

[1] Department of Family Medicine and Community Health, Faculty of Physical Therapy, University of Minnesota Twin Cities Medical School, Minnesota, USA
[2] Department of Psychology and Counseling, Kman Research Institute, Richmond Hill, Ontario, Canada
[3] Department of Psychology, Clark University, USA
[1] Department of Psychology, Queen's University, Kingston, Canada

* **Corresponding author email address**: saada@umn.edi

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ABSTRACT

Objective: This study aimed to explore the perceived determinants of quality of life among women with breast cancer after completion of radiotherapy.

Methods and Materials: This qualitative study was conducted using a conventional content analysis approach. Participants were 24 women with breast cancer in Canada who had completed radiotherapy and were recruited through purposive sampling with maximum variation in age, marital status, educational level, employment status, cancer stage, treatment history, and time elapsed since radiotherapy. Data were collected through semi-structured individual interviews, a demographic and clinical information form, and field notes. Interviews focused on women's perceptions of physical, emotional, social, relational, healthcare-related, and existential factors affecting their quality of life after radiotherapy. All interviews were audio-recorded, transcribed verbatim, and analyzed using conventional qualitative content analysis. Meaning units were identified, condensed, coded, compared, and organized into subcategories and main categories. Credibility, dependability, confirmability, and transferability were strengthened through prolonged engagement with the data, peer debriefing, reflexive memo writing, participant confirmation of selected interpretations, and maintenance of an audit trail.

Findings: The analysis revealed five main categories that explained the perceived determinants of quality of life after radiotherapy: physical recovery, emotional reconstruction, relational support, healthcare continuity, and restored personal agency. Physical recovery included fatigue, pain, skin and breast changes, sleep disturbance, and reduced physical capacity. Emotional reconstruction reflected fear of recurrence, uncertainty, altered self-confidence, emotional exhaustion, and gradual acceptance. Relational support included family understanding, partner communication, peer support, and reduced isolation. Healthcare continuity involved information, accessible follow-up, side-effect management, and trust in professionals. Restored personal agency referred to return to roles, self-care strategies, body acceptance, and redefinition of normal life.

Conclusion: Quality of life among women with breast cancer after radiotherapy is shaped by an interconnected recovery process involving physical symptoms, emotional adjustment, social support, healthcare responsiveness, and the reconstruction of personal control. Post-radiotherapy survivorship care should therefore extend beyond clinical monitoring and include comprehensive physical, psychological, relational, informational, and practical support.

Keywords: *Breast Cancer; Radiotherapy; Quality of Life; Women's Health; Survivorship; Qualitative Content Analysis; Patient Experience; Supportive Care*

1. Introduction

Breast cancer remains one of the most consequential conditions affecting women's physical health, psychosocial functioning, family roles, body image, and long-term sense of well-being. Advances in screening, surgery, systemic therapy, radiotherapy, reconstruction, endocrine therapy, and supportive care have improved disease control and survival, but they have also shifted attention toward survivorship and the quality of life experienced after completion of active treatment. Contemporary breast cancer care is therefore no longer evaluated only through tumor response, local control, recurrence risk, or survival outcomes; it is also judged by the extent to which women are able to live with dignity, functional independence, emotional security, relational stability, and acceptable bodily comfort after treatment. This broader orientation is consistent with the growing emphasis on patient-reported outcomes, survivorship needs, and treatment de-escalation where oncologically safe, particularly in contexts where long-term physical and psychosocial consequences may persist beyond the formal endpoint of treatment (Bonci et al., 2023; Fairweather et al., 2024; Faithfull & Greenfield, 2024).

Radiotherapy is a central component of breast cancer treatment, particularly after breast-conserving surgery and in selected postmastectomy settings. It contributes substantially to local control and is frequently integrated with surgery, chemotherapy, endocrine therapy, and reconstructive approaches in multidisciplinary treatment planning. The evolution of breast cancer management over recent decades has been characterized by increasing personalization of surgical and radiotherapy strategies, including breast-conserving approaches, therapeutic mammaplasty, intraoperative radiotherapy, reconstruction-related radiotherapy planning, and debates concerning the optimal sequencing and intensity of treatment (Cao et al., 2024; Keelan et al., 2021; Lee et al., 2021; Vaidya et al., 2021). However, even when radiotherapy is clinically effective and technically precise, women may continue to experience treatment-related physical discomfort, fatigue, skin and breast changes, pain, sleep disruption, fear of recurrence, and uncertainty regarding future health. The post-radiotherapy period is therefore a clinically important phase of survivorship in which the patient may be medically discharged from active daily treatment while still experiencing the embodied and emotional consequences of cancer care.

Quality of life after breast cancer treatment is multidimensional and is shaped by physical, psychological, social, sexual, functional, spiritual, and healthcare-related factors. Studies comparing surgical approaches have shown that treatment modality may influence postoperative quality of life, body image, functional recovery, and satisfaction with treatment, especially when women must adapt to breast conservation, mastectomy, reconstruction, or axillary procedures (Asghar et al., 2025; Cherian et al., 2022; Noëlle et al., 2023). The effect of treatment does not occur in isolation; rather, it accumulates across surgery, chemotherapy, radiotherapy, endocrine therapy, and rehabilitation. Evidence regarding quality of life among breast cancer patients receiving chemotherapy with or without radiation therapy further indicates that radiotherapy must be understood within the broader therapeutic trajectory rather than as a single isolated event (Morse et al., 2025). For women who undergo radiotherapy after previous systemic and surgical treatments, quality of life may reflect the combined burden of symptom accumulation, recovery expectations, social obligations, and the demand to resume ordinary life before full physical or emotional recovery has occurred.

Physical symptoms are among the most visible and persistent determinants of quality of life after breast cancer treatment. Fatigue is repeatedly identified as a major cancer-related symptom that compromises daily functioning, physical activity, emotional resilience, social participation, and perceived autonomy (Muthanna et al., 2023). In addition, breast and upper-limb complications such as pain, tightness, shoulder restriction, breast edema, and lymphedema can alter women's ability to perform household activities, return to work, exercise, sleep comfortably, and maintain confidence in the treated body (Fearn et al., 2022; Samela et al., 2022). The experience of lymphedema and related functional impairment may also extend beyond the patient herself, affecting caregivers' emotional burden and anxiety, thereby showing that quality of life after breast cancer treatment is embedded in family and caregiving systems (Büyük et al., 2024). These physical consequences are important not merely because they represent medical side effects, but because they become part of women's everyday negotiation of energy, appearance, mobility, dependence, and self-care.

Sleep disturbance is another important dimension of survivorship that may interact with fatigue, anxiety, pain, hot flashes, endocrine therapy symptoms, and fear of recurrence. Insomnia in cancer patients has been described as a clinically meaningful concern with implications for emotional regulation, daytime functioning, and overall quality of life (Chekani et al., 2023). For women after radiotherapy, sleep may be affected by physical discomfort in the treated breast or chest wall, difficulty finding comfortable positions, intrusive thoughts about cancer recurrence, or general treatment-related distress. Sleep problems can intensify fatigue and reduce capacity for recovery, thereby creating a cycle in which physical symptoms and emotional distress reinforce each other. Therefore, quality of life after radiotherapy must be examined not only in terms of isolated symptoms but also through the interdependence of bodily discomfort, rest, energy, mood, and daily performance.

Psychological consequences are equally central to women's perceived quality of life after breast cancer treatment. Diagnosis, treatment, remission, and survivorship each carry emotional meanings that can include fear, grief, vulnerability, relief, gratitude, uncertainty, and pressure to appear strong. The psychological impact of breast cancer is often intensified by the contrast between the external perception that treatment completion represents recovery and the internal experience that fear and bodily disruption continue after treatment (Graham, 2024). Women may fear recurrence, struggle with altered self-image, experience anxiety before follow-up visits, or feel uncertain about whether they can trust their bodies again. These concerns may be especially salient after radiotherapy, when the frequency of direct contact with the oncology team decreases and patients must interpret new or persistent symptoms with less immediate professional reassurance.

Sexual quality of life and intimate relationships are also important but sometimes under-addressed components of survivorship. Breast cancer and its treatments may affect femininity, attractiveness, bodily confidence, sexual desire, comfort with touch, and communication with partners. Research on sexual quality of life among adolescent and young adult breast cancer survivors highlights the need to consider sexuality, developmental stage, relational expectations, and long-term identity reconstruction as part of survivorship care (Noëlle et al., 2024). Although sexual concerns may vary by age and relationship status, women across different life stages can experience distress related to breast appearance, scarring, tenderness, fatigue, menopausal symptoms, and fear of rejection. In the post-radiotherapy period, such concerns may be particularly complex because the treated breast can remain sensitive or visibly changed while the woman is expected to resume intimate and social roles.

Healthcare continuity and communication are fundamental determinants of quality of life after radiotherapy. Patient-reported outcome measures used within radiotherapy trials have raised important questions about whether existing instruments fully capture the practical and subjective impact of treatment from the patient perspective (Fairweather et al., 2024). Similarly, trials examining radiation and endocrine therapy sequencing and protocols comparing preoperative and postmastectomy radiotherapy in reconstructed patients demonstrate that clinical decision-making increasingly considers patient-reported outcomes and safety alongside oncological endpoints (Hao et al., 2025; McGee et al., 2024). Nevertheless, quantitative measures may not fully explain how women interpret symptoms, evaluate care, negotiate uncertainty, or define quality of life after treatment. Qualitative inquiry is therefore necessary to illuminate the meanings women assign to recovery, support, bodily changes, and the adequacy of post-treatment guidance.

Supportive care interventions have become increasingly important in efforts to improve quality of life among breast cancer survivors. Exercise is one of the most frequently studied approaches, with systematic evidence indicating its potential value for physical functioning, fatigue reduction, emotional well-being, and overall quality of life (Gupta et al., 2025; Misiąg et al., 2022). Clinical trials have also examined exercise therapy in combination with other supportive modalities such as acupuncture and silicon oxide tablets for outcomes including muscular strength, lymphedema, and quality of life (Giron et al., 2025). Respiratory physiotherapy and rehabilitation-oriented strategies have similarly been discussed in relation to sequelae of breast cancer treatment, showing the relevance of structured physical recovery programs after oncology treatment (Viñolo-Gil et al., 2022). These findings suggest that physical recovery after radiotherapy is not passive; it may require guidance, graded activity, rehabilitation, and individualized support that help women regain confidence in their bodies.

Complementary and integrative approaches have also received increasing attention in cancer supportive care. Yoga has been examined as a complementary therapy for cancer patients, with interest in both clinical outcomes and potential biological mechanisms (Blockhuys & Wittung-Stafshede, 2024). Earlier work also reported that yoga may improve quality of life among breast cancer patients, supporting its relevance as a mind-body practice that may address physical, emotional, and existential dimensions of recovery (Setiawan et al., 2021). More broadly, systematic reviews of integrative therapeutic methods suggest that interventions such as exercise, rehabilitation, psychological support, nutrition-related strategies, and complementary therapies may contribute to functioning and quality of life among cancer patients when appropriately integrated with conventional care (Iliescu et al., 2024). However, women's own perceptions of which strategies are useful, acceptable, accessible, and meaningful after radiotherapy require further exploration.

Nutrition and lifestyle-related supportive care may also shape perceived recovery. Evidence regarding nutritional supplements for cancer supportive care has emphasized the need to evaluate efficacy and safety carefully rather than assuming benefit based on popularity or patient interest (Benna-Doyle et al., 2026). In addition, studies of calorie restriction and time-restricted feeding among patients undergoing radiotherapy indicate the growing interest in metabolic and lifestyle interventions during cancer treatment, although such approaches require careful clinical consideration (Vega et al., 2024). For women after breast cancer radiotherapy, nutrition may be perceived not only as a biomedical strategy but also as a way to regain agency, reduce vulnerability, and participate actively in recovery. These meanings are important because quality of life is influenced not only by clinical recommendations but also by whether women feel capable of acting in ways that support their health.

Social, cultural, and spiritual resources may further influence survivorship experiences. Research on African American long-term breast cancer survivors has shown that spirituality may be associated with physical activity and sleep, highlighting the role of meaning, belief, and culturally embedded coping resources in survivorship behaviors (Goerge et al., 2023). Studies of unmet needs among breast cancer survivors also show that informational, emotional, physical, practical, and healthcare-related needs may remain insufficiently addressed after treatment (Bu et al., 2022). Post-treatment quality of life among women in different international settings further demonstrates that survivorship experiences are shaped by cultural expectations, health system resources, family roles, and access to care (Crisostomo & Sugui, 2022; Seneviratne et al., 2022). Therefore, perceived determinants of quality of life after radiotherapy should be understood within the broader social ecology of survivorship, including family support, financial concerns, work expectations, spirituality, and healthcare accessibility.

Age and clinical complexity also influence quality of life after treatment. Older women with breast cancer may require comprehensive assessment that attends to comorbidity, functional status, cognition, frailty, social support, and treatment tolerance, rather than relying solely on chronological age (Reid-Agboola et al., 2023). Women with advanced or locally complex breast cancer may face additional uncertainty related to local control, multidisciplinary treatment decisions, reconstructive issues, systemic therapy, and the balance between disease management and quality of life (Pantelimon et al., 2025). These considerations are relevant because radiotherapy experiences are not homogeneous; the meaning and burden of radiotherapy may differ according to age, stage, treatment pathway, reconstruction status, family responsibility, and prior experiences with the healthcare system.

Studies focusing specifically on patients' experiences of radiotherapy have shown that different radiotherapy approaches may carry distinct practical and emotional meanings. Qualitative exploration of patients' experiences with targeted intraoperative radiotherapy and external-beam radiotherapy suggests that treatment convenience, perceived burden, information, expectations, and personal interpretation of treatment can shape the patient experience (Bagga et al., 2023). Such evidence underscores the value of qualitative methods for understanding what women consider important in their own terms. While clinical studies can identify symptom prevalence or measure health-related quality of life scores, qualitative content analysis can reveal how women connect symptoms to identity, family life, intimacy, work, spirituality, and trust in care. This approach is especially suitable for identifying perceived determinants of quality of life after radiotherapy because it allows categories to emerge from participants' narratives rather than imposing predefined assumptions.

Despite expanding evidence on breast cancer treatment outcomes, patient-reported measures, supportive interventions, and survivorship care, important gaps remain in understanding how women themselves define and prioritize the determinants of quality of life after radiotherapy. Existing research has provided valuable knowledge on surgical outcomes, radiotherapy sequencing, fatigue, lymphedema, sleep disturbance, sexuality, exercise, integrative care, nutritional strategies, and unmet needs; however, these strands of evidence are often examined separately rather than integrated through women's lived accounts of post-radiotherapy recovery. A qualitative content analysis can therefore contribute by clarifying how physical symptoms, emotional reconstruction, relational support, healthcare continuity, and restoration of personal agency interact in everyday life after radiotherapy.

The aim of this study was to explore the perceived determinants of quality of life among women with breast cancer after radiotherapy using a qualitative content analysis approach.

2. Methods and Materials

2.1. *Study Design and Participants*

This study was conducted using a qualitative design with a conventional content analysis approach to explore the perceived determinants of quality of life among women with breast cancer after completion of radiotherapy. The study was carried out in oncology and radiotherapy follow-up clinics affiliated with cancer care centers in Canada. Participants were selected through purposive sampling with maximum variation in age, marital status, educational level, employment status, cancer stage, type of surgery, time elapsed since radiotherapy, and history of adjuvant treatments in order to obtain a broad range of experiences related to quality of life after radiotherapy. The study population consisted of women diagnosed with breast cancer who had completed radiotherapy and were attending post-treatment follow-up appointments. A total of 24 women with breast cancer participated in the study. Inclusion criteria were being female, being 18 years of age or older, having a confirmed diagnosis of breast cancer, having completed radiotherapy at least one month and no more than 18 months before the interview, being able to communicate in English, and having sufficient physical and psychological ability to participate in an interview. Women were excluded if they had severe cognitive impairment, acute psychiatric distress, unstable medical conditions, or recurrence requiring immediate intensive treatment at the time of recruitment. Sampling continued until data saturation was reached, meaning that no new categories or substantial conceptual insights emerged from the final interviews. All participants received verbal and written explanations about the purpose and process of the study, the voluntary nature of participation, confidentiality of information, and their right to withdraw at any time without any effect on their care. Written informed consent was obtained from all participants before data collection.

2.2. *Measures*

Data were collected using a demographic and clinical information form, semi-structured individual interviews, and field notes. The demographic and clinical information form was developed by the research team and included questions about age, marital status, educational level, employment status, living situation, cancer stage, type of breast surgery, chemotherapy history, hormone therapy status, time since completion of radiotherapy, and presence of treatment-related complications. The main data collection tool was an interview guide designed to elicit participants' lived perceptions of factors influencing their quality of life after radiotherapy. The interview guide included open-ended questions such as how participants described their quality of life after radiotherapy, what physical, emotional, social, family-related, financial, spiritual, and healthcare-related factors affected their daily life, what changes they experienced after treatment, and what forms of support helped or hindered their adaptation. Probing questions were used to deepen the interviews and clarify participants' meanings, including requests for examples, explanations of specific experiences, and descriptions of changes over time. The interview guide was reviewed by experts in oncology nursing, qualitative research, psycho-oncology, and women's health to ensure clarity, relevance, and appropriateness. Two pilot interviews were conducted to refine the wording and sequencing of questions; because these interviews provided rich and relevant data, they were included in the final analysis. Interviews were conducted in a private room at the clinic or through secure online video calls according to participants' preferences. Each interview lasted approximately 45 to 75 minutes and was audio-recorded with permission. Field notes were written immediately after each interview to document nonverbal expressions, contextual details, emotional tone, and the interviewer's reflections.

2.3. *Data Analysis*

Data analysis was performed using conventional qualitative content analysis. All interviews were transcribed verbatim and checked against the audio files to ensure accuracy. The analysis began with repeated reading of the transcripts to obtain a general understanding of the participants' experiences. Meaning units related to perceived determinants of quality of life after radiotherapy were then identified, condensed, and labeled with initial codes while preserving the core meaning of participants' statements.

Codes with conceptual similarity were compared continuously and grouped into subcategories. Through further abstraction and constant comparison, subcategories were organized into broader categories that reflected the main perceived determinants of quality of life among women after radiotherapy. Data analysis was conducted concurrently with data collection, allowing emerging concepts to guide later interviews and support theoretical depth. To enhance credibility, prolonged engagement with the data, peer debriefing among members of the research team, and participant confirmation of selected interpretations were used. Dependability was supported by maintaining a detailed audit trail of methodological decisions, coding processes, category development, and revisions during analysis. Confirmability was strengthened through reflexive memo writing and regular discussion of the researchers' assumptions and interpretations. Transferability was addressed by providing detailed descriptions of the study context, participants' characteristics, sampling strategy, and data collection procedures. Qualitative data management was supported using qualitative analysis software, while final interpretation remained grounded in the researchers' iterative reading, comparison, and abstraction of the data.

3. Findings and Results

A total of 24 women with breast cancer who had completed radiotherapy participated in the study. The participants ranged in age from 34 to 72 years, with a mean age of 54.8 years. Most participants were married or living with a partner, while others were single, widowed, divorced, or separated. In terms of educational status, the sample included women with secondary education, college diplomas, undergraduate degrees, and postgraduate education, which provided variation in health literacy, communication with healthcare providers, and access to supportive resources. Regarding employment status, some participants were employed full-time or part-time, some were retired, and others were on medical leave or had stopped working temporarily because of treatment-related fatigue, emotional distress, or physical limitations. Clinically, participants had been diagnosed with stage I, II, or III breast cancer and had completed radiotherapy between two and sixteen months before the interview. Fifteen participants had undergone breast-conserving surgery, while nine had undergone mastectomy. Fourteen participants had received chemotherapy before radiotherapy, and eighteen were receiving hormone therapy at the time of interview. The variation in age, treatment pathway, family situation, work status, and time elapsed since radiotherapy allowed the analysis to capture a broad range of perceived determinants of quality of life after radiotherapy.

Table 1

Main Categories and Subcategories of Perceived Determinants of Quality of Life Among Women With Breast Cancer After Radiotherapy

Main category	Subcategories	Core analytic meaning
Living with the treated body	Persistent fatigue, skin and breast changes, pain and physical discomfort, sleep disturbance, reduced physical capacity	Quality of life was strongly shaped by the extent to which women could tolerate, manage, and reinterpret physical changes after radiotherapy.
Emotional reconstruction after treatment	Fear of recurrence, uncertainty about the future, changes in self-confidence, emotional exhaustion, gradual psychological adjustment	Participants described the post-radiotherapy period as emotionally demanding because the end of treatment did not always mean the end of fear, vulnerability, or psychological burden.
Social and relational support	Family understanding, partner intimacy, peer support, social isolation, communication with others	Supportive relationships improved adaptation, whereas misunderstanding, overprotection, silence, or social withdrawal reduced women's perceived quality of life.
Continuity and responsiveness of care	Information needs, follow-up care, access to professionals, management of side effects, trust in the healthcare team	Women experienced better quality of life when healthcare providers offered clear information, accessible follow-up, emotional reassurance, and practical guidance after radiotherapy.
Restoration of agency and meaning	Return to daily roles, self-care strategies, spiritual and existential reflection, body acceptance, redefinition of normal life	Quality of life improved when participants regained a sense of control, reconstructed personal meaning, and developed practical routines for living beyond treatment.

Table 1 presents the five main categories and related subcategories extracted from the qualitative content analysis. The findings indicate that quality of life after radiotherapy was not perceived as a single physical or medical outcome, but as a multidimensional experience shaped by bodily changes, emotional adjustment, social relationships, healthcare responsiveness, and the gradual restoration of agency. Participants repeatedly emphasized that the period after radiotherapy was a transitional phase in which they were expected by others to return to normal life, while they themselves were still dealing with fatigue, bodily sensitivity, fear of recurrence, uncertainty, and altered self-perception. The categories were closely interconnected. For example, persistent fatigue affected women's ability to work, participate in family roles, maintain social relationships, and engage in self-care activities. Similarly, clear communication with healthcare providers reduced uncertainty and supported emotional reconstruction. The findings therefore suggest that perceived quality of life after radiotherapy is determined by the interaction between treatment-related consequences and the personal, relational, and systemic resources available to women during survivorship.

Table 2

Physical and Functional Determinants of Quality of Life After Radiotherapy

Subcategory	Representative codes	Perceived influence on quality of life
Persistent fatigue	Lack of energy, need for frequent rest, difficulty completing household tasks, delayed recovery after activity	Fatigue was described as one of the most disruptive consequences of radiotherapy because it limited independence, reduced productivity, and made women feel older or weaker than before diagnosis.
Skin and breast changes	Burning sensation, skin darkening, breast tightness, sensitivity to clothing, changes in breast appearance	Visible and sensory changes in the treated area affected comfort, body image, clothing choices, intimacy, and confidence in social situations.
Pain and physical discomfort	Shoulder stiffness, chest wall tenderness, arm heaviness, discomfort during sleep, movement limitation	Pain and discomfort restricted physical activity and reminded participants of the illness even after active treatment had ended.
Sleep disturbance	Difficulty falling asleep, nighttime worry, discomfort in lying position, hot flashes, interrupted sleep	Poor sleep intensified fatigue, irritability, anxiety, and difficulty concentrating during daily activities.
Reduced physical capacity	Slower walking, difficulty exercising, reduced stamina, dependence on others, fear of overexertion	Reduced capacity affected women's sense of autonomy and delayed their return to previous routines, especially work, caregiving, and social participation.

Table 2 shows that physical and functional determinants formed one of the most immediate and frequently reported dimensions of quality of life after radiotherapy. Participants did not describe physical side effects as isolated symptoms; rather, they explained how these symptoms entered daily life and changed their ability to function. Fatigue was the most prominent physical determinant and was often experienced as unpredictable, persistent, and difficult for others to understand. Some participants stated that although radiotherapy sessions had ended, their bodies continued to feel as if they were still in treatment. Skin changes, breast tenderness, tightness, and sensitivity also influenced comfort and self-perception, particularly when women selected clothing, looked at themselves in the mirror, or experienced physical closeness with their partners. Pain, stiffness, and reduced arm movement were not only sources of discomfort but also barriers to household tasks, exercise, and sleep. Sleep disturbance appeared both as a physical and psychological issue, because bodily discomfort, hormone therapy symptoms, and fear-related thoughts often occurred together at night. Overall, the physical findings indicate that quality of life after radiotherapy depends greatly on whether women receive adequate guidance for symptom management and whether they are able to gradually rebuild confidence in their physical abilities.

Table 3

Emotional, Cognitive, and Existential Determinants of Quality of Life After Radiotherapy

Subcategory	Representative codes	Perceived influence on quality of life
Fear of recurrence	Worry about new pain, anxiety before follow-up visits, interpreting bodily sensations as danger, fear of future scans	Fear of recurrence reduced emotional security and made participants feel that recovery was fragile and uncertain.
Uncertainty about the future	Doubt about long-term health, concern about treatment effectiveness, difficulty making plans, hesitation about returning to previous goals	Uncertainty disrupted future orientation and made some women cautious about work, travel, relationships, and personal planning.
Changes in self-confidence	Feeling less attractive, reduced trust in the body, embarrassment about physical changes, hesitation in social settings	Altered self-confidence influenced body image, intimacy, social participation, and women's sense of femininity.

Emotional exhaustion	Feeling mentally tired, irritability, sadness after treatment, pressure to appear strong, difficulty discussing distress	Emotional exhaustion reduced motivation and made participants feel unsupported when others assumed that treatment completion meant full recovery.
Spiritual and meaning-based adjustment	Gratitude for survival, re-evaluation of priorities, prayer or meditation, desire to live more intentionally, acceptance of vulnerability	Meaning-based reflection helped some participants cope with distress and reconstruct a more hopeful understanding of life after cancer.

Table 3 illustrates that emotional and cognitive determinants were central to participants' quality of life after radiotherapy. Many women described the post-treatment stage as psychologically complex because the end of radiotherapy created relief, but also exposed them to new fears. During active treatment, participants felt closely monitored by the healthcare system; after radiotherapy, however, some felt emotionally alone and uncertain about whether the disease might return. Fear of recurrence was intensified by bodily sensations such as pain, swelling, fatigue, or skin changes, because these symptoms were sometimes interpreted as possible signs of cancer progression. Uncertainty also affected the ability to plan for the future. Several participants described postponing major decisions, limiting long-term plans, or feeling hesitant to assume that they were fully well. Changes in body image and self-confidence were especially important among participants who experienced breast changes, mastectomy, scarring, or discomfort during intimacy. At the same time, some women reported that breast cancer and radiotherapy led them to reassess their values, relationships, and priorities. For these participants, quality of life improved when they were able to transform the experience into a source of meaning, gratitude, self-awareness, or spiritual growth. Thus, emotional quality of life after radiotherapy was shaped by both distress and reconstruction, with women moving between fear, vulnerability, acceptance, and renewed purpose.

Table 4

Social, Healthcare-Related, and Practical Determinants of Quality of Life After Radiotherapy

Subcategory	Representative codes	Perceived influence on quality of life
Family understanding	Practical help, emotional presence, patience with fatigue, assistance with appointments, reduced household expectations	Supportive family responses reduced burden and helped women feel cared for, understood, and less isolated.
Partner intimacy and communication	Comfort with body changes, sexual concerns, emotional closeness, fear of rejection, difficulty discussing needs	Quality of life improved when partners were emotionally responsive, but declined when women felt unattractive, misunderstood, or unable to communicate about intimacy.
Peer support	Talking to other survivors, normalization of symptoms, shared coping strategies, feeling understood by similar others	Peer contact helped participants feel less alone and provided practical knowledge that was sometimes missing from formal care.
Information and follow-up care	Clear explanation of side effects, survivorship guidance, access to nurses or physicians, reassurance during follow-up	Continuity of care reduced uncertainty and helped participants manage symptoms, expectations, and emotional concerns after radiotherapy.
Work and financial pressure	Delayed return to work, reduced income, insurance concerns, workplace expectations, cost of transportation and supportive care	Financial and occupational stress reduced quality of life, particularly among women who lacked flexible employment conditions or sufficient social benefits.
Self-care and lifestyle strategies	Gentle exercise, nutrition, rest planning, skin care, pacing activities, mindfulness, support groups	Women reported better adaptation when they developed routines that allowed them to regain control over their bodies and daily lives.

Table 4 demonstrates that quality of life after radiotherapy was deeply influenced by the social and practical environment in which women recovered. Family support was one of the strongest positive determinants, particularly when relatives recognized that fatigue and emotional distress could continue after treatment. Participants valued practical help with transportation, meals, household responsibilities, and childcare, but they also emphasized the importance of emotional patience and nonjudgmental listening. Partner support was especially important in relation to body image, sexual confidence, and emotional safety. Some women described their partners as a major source of reassurance, while others experienced silence, discomfort, or difficulty discussing intimacy after treatment. Peer support was also described as uniquely valuable because other survivors understood fears, side effects, and recovery challenges in ways that family members or friends sometimes could not. Healthcare-related determinants were equally important. Participants who received clear explanations, accessible follow-up, and practical advice about side effects reported greater confidence and lower anxiety. In contrast, women who felt that post-radiotherapy concerns were minimized experienced uncertainty and reduced trust. Work and financial pressures further shaped quality of life, particularly for women who had to return to employment before feeling physically or emotionally ready. Finally, self-care strategies such as pacing, walking, skin care, rest planning, healthy eating, mindfulness, and participation in support groups helped women regain control and gradually reconstruct a manageable everyday life.

Figure 1

Conceptual Model of Perceived Determinants of Quality of Life Among Women With Breast Cancer After Radiotherapy

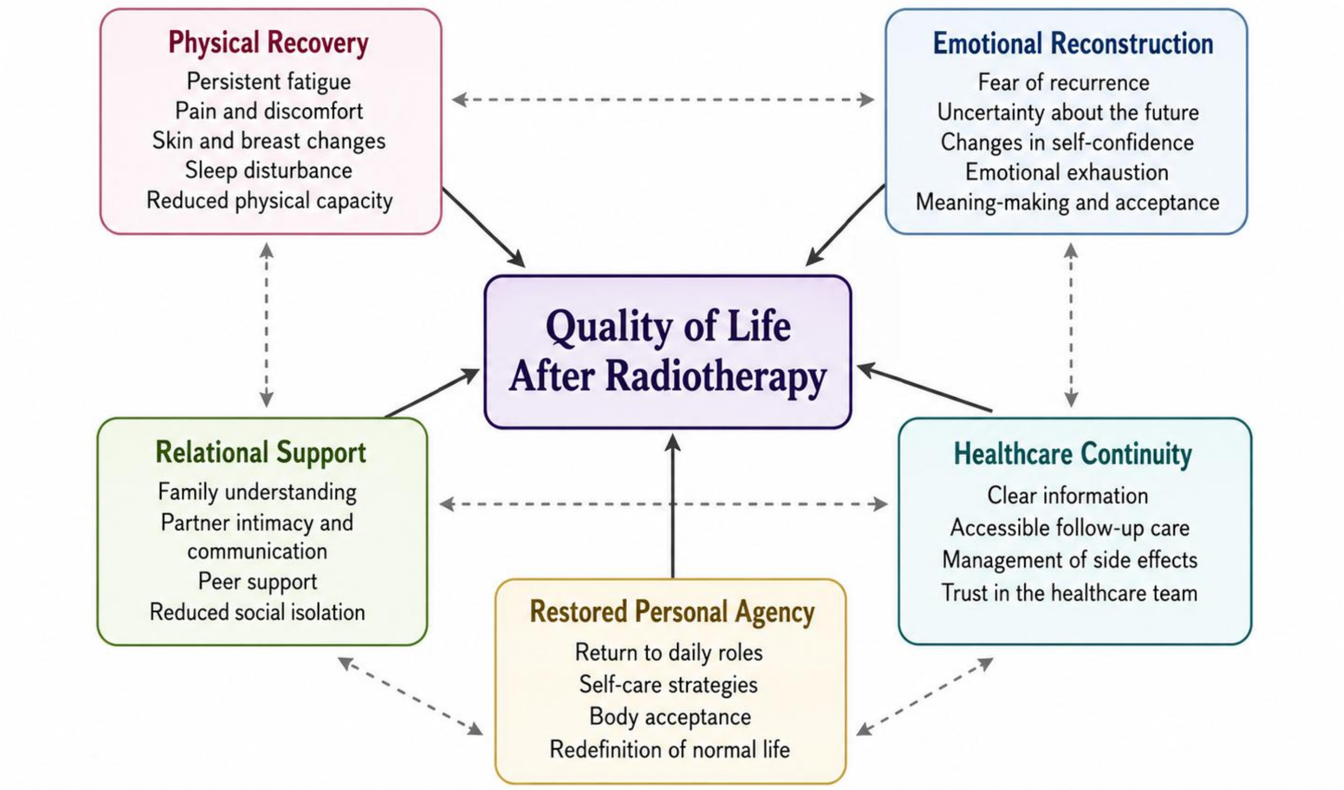

Figure 1 summarizes the conceptual interpretation of the findings and shows that perceived quality of life after radiotherapy emerged from the interaction of five interrelated domains: physical recovery, emotional reconstruction, relational support, healthcare continuity, and restored personal agency. In this model, physical recovery forms the immediate foundation of post-radiotherapy quality of life because fatigue, pain, sleep disturbance, and bodily changes directly affect daily functioning. Emotional reconstruction develops alongside physical recovery and is influenced by fear of recurrence, uncertainty, self-confidence, and meaning-making. Relational support, including family, partner, peer, and social support, can either buffer distress or intensify isolation depending on the quality of understanding and communication. Healthcare continuity functions as a stabilizing determinant because clear information, accessible follow-up, and symptom management reduce uncertainty and promote confidence. Finally, restored agency reflects the participant's gradual ability to resume valued roles, practice self-care, accept bodily changes, and redefine normal life after treatment. The model indicates that quality of life after radiotherapy is not determined only by symptom severity, but by the degree to which women can integrate bodily changes, emotional concerns, supportive relationships, healthcare guidance, and personal meaning into a renewed sense of everyday life.

Overall, the findings revealed that women's perceived quality of life after radiotherapy was shaped by a dynamic and multidimensional recovery process. Participants did not define quality of life merely as survival or absence of disease; instead, they associated it with the ability to feel physically capable, emotionally secure, socially supported, informed by healthcare professionals, and personally in control of daily life. For many women, the period after radiotherapy involved a tension between external expectations of recovery and internal experiences of ongoing vulnerability. While family members, employers, and sometimes even healthcare systems expected a return to normal life, participants often continued to experience fatigue, body image concerns, fear of recurrence, and uncertainty about the future. The most favorable quality of life experiences were reported when women had access to supportive relationships, clear medical guidance, flexible work and family expectations, and practical strategies for self-care. Conversely, quality of life was reduced when women felt physically limited, emotionally alone, poorly informed, financially pressured, or unable to express concerns about body image and intimacy. These findings emphasize that post-radiotherapy survivorship care should address not only clinical follow-up, but also the physical, psychological, social, informational, and existential dimensions of women’s lives after breast cancer treatment.

4. Discussion

The present study explored the perceived determinants of quality of life among women with breast cancer after radiotherapy and identified five interrelated domains: physical recovery, emotional reconstruction, relational support, healthcare continuity, and restored personal agency. The findings showed that women did not perceive quality of life after radiotherapy merely as the absence of cancer progression or the completion of treatment. Instead, quality of life was experienced as a dynamic survivorship condition shaped by how participants managed bodily symptoms, interpreted emotional vulnerability, received support from family and healthcare professionals, and gradually reconstructed a sense of control over daily life. This multidimensional interpretation is consistent with the broader direction of breast cancer survivorship literature, which increasingly emphasizes patient-reported outcomes, late effects, and the long-term consequences of treatment beyond conventional clinical endpoints (Fairweather et al., 2024; Faithfull & Greenfield, 2024). The findings therefore support the view that post-radiotherapy survivorship should be understood as an active phase of adjustment rather than a simple return to pre-diagnosis normality.

The first major finding was that physical recovery was a central determinant of quality of life. Participants described persistent fatigue, pain and discomfort, breast and skin changes, sleep disturbance, and reduced physical capacity as factors that influenced daily functioning and self-perception. Fatigue was particularly prominent because it affected household activities, return to work, social engagement, and confidence in the body. This finding aligns with evidence showing that fatigue is one of the most burdensome symptoms among cancer patients and has a significant negative impact on quality of life (Muthanna et al., 2023). The importance of physical functioning is also supported by studies on exercise and rehabilitation in breast cancer survivors, which have shown that physical activity and structured exercise interventions can improve quality of life, strength, function, and treatment-related symptoms (Giron et al., 2025; Gupta et al., 2025; Misiąg et al., 2022). The present findings extend this evidence by showing that women interpret physical recovery not only in biomedical terms, but also as a condition for independence, social participation, emotional security, and restored identity.

Pain, breast sensitivity, upper-limb discomfort, and lymphedema-related concerns were also perceived as important determinants of quality of life. These findings are consistent with studies showing that breast cancer treatment may lead to physical sequelae such as breast lymphedema, upper-limb dysfunction, and movement limitations, all of which may affect quality of life and daily activities (Fearn et al., 2022; Samela et al., 2022). The findings also correspond with evidence that lymphedema and related impairments may influence not only patients but also caregivers, indicating that physical complications have relational and family-level consequences (Büyük et al., 2024). Participants in the present study described physical symptoms as reminders of cancer and treatment, which suggests that symptom burden after radiotherapy may carry emotional and symbolic meanings. This supports the need to move beyond symptom counting and toward understanding how bodily changes are integrated into women’s everyday lives after treatment.

The second major finding concerned emotional reconstruction after radiotherapy. Participants reported fear of recurrence, uncertainty about the future, changes in self-confidence, emotional exhaustion, and the gradual search for acceptance and meaning. This finding is consistent with research emphasizing the psychological burden of breast cancer diagnosis, treatment, remission, and survivorship (Graham, 2024). In the present study, women often experienced a mismatch between external expectations of recovery and their internal experience of continued vulnerability. This is important because the completion of radiotherapy may reduce frequent clinical contact, leaving women to interpret bodily sensations and emotional distress with less immediate reassurance. Similar concerns have been reflected in studies addressing patient-reported outcomes in radiotherapy and the need for outcome measures that capture the real impact of treatment from the patient perspective (Fairweather et al., 2024). Thus, emotional quality of life after radiotherapy appears to depend not only on the presence or absence of anxiety, but also on whether women feel informed, validated, and supported during the transition from treatment to survivorship.

Body image, sexuality, and self-confidence emerged as further dimensions of emotional reconstruction. Participants described changes in how they viewed their bodies, how they experienced intimacy, and how they negotiated femininity after treatment. These findings are consistent with evidence that different breast cancer treatments, including surgery, axillary treatment, reconstruction, and radiotherapy, can influence body image, sexual quality of life, and psychosocial well-being (Cherian et al., 2022; Noëlle et al., 2023; Noëlle et al., 2024). Research on surgical management and oncoplastic or reconstructive approaches has also emphasized that treatment decisions should consider not only disease control but also appearance, function, patient satisfaction, and long-term quality of life (Bonci et al., 2023; Keelan et al., 2021; Lee et al., 2021). The present findings contribute to this literature by showing that even after radiotherapy is completed, women may continue to experience the treated body as changed, vulnerable, or unfamiliar, and this may affect confidence in social and intimate contexts.

The third major finding was that relational support strongly influenced perceived quality of life. Family understanding, partner communication, peer support, and reduced social isolation were described as protective factors, while misunderstanding, silence, or unrealistic expectations could intensify distress. This finding is consistent with studies of unmet needs among breast cancer survivors, which indicate that emotional, informational, practical, and social needs may remain insufficiently addressed after treatment (Bu et al., 2022). Social and cultural contexts may shape how women interpret recovery, express distress, and seek support. Evidence from studies of post-treatment quality of life in different countries suggests that survivorship is influenced by healthcare access, family systems, cultural expectations, and available resources (Crisostomo & Sugui, 2022; Seneviratne et al., 2022). The present findings similarly suggest that quality of life after radiotherapy is not a private individual state alone; it is constructed within relationships that either help women adapt or make them feel isolated in their recovery.

Spirituality and meaning-making were also relevant to relational and existential adjustment. Some participants described gratitude, re-evaluation of priorities, prayer, reflection, or a desire to live more intentionally. This finding is consistent with research showing that spirituality may be associated with health behaviors such as physical activity and sleep among long-term breast cancer survivors (Goerge et al., 2023). Complementary practices such as yoga may also support quality of life by integrating physical movement, emotional regulation, and mind-body awareness (Blockhuys & Wittung-Stafshede, 2024; Setiawan et al., 2021). More broadly, integrative therapeutic methods have been reviewed as approaches that may improve functioning and quality of life among cancer patients when appropriately incorporated into supportive care (Iliescu et al., 2024). The present study suggests that such practices may be meaningful not only because they reduce symptoms, but because they help women regain agency, reconnect with their bodies, and construct a more coherent sense of life after treatment.

The fourth major finding was the importance of healthcare continuity and responsiveness. Participants reported better quality of life when they received clear information, accessible follow-up care, guidance about side effects, and reassurance from healthcare professionals. This finding aligns with current attention to patient-reported outcomes and safety in breast cancer radiotherapy trials and treatment sequencing studies (Hao et al., 2025; McGee et al., 2024). It is also consistent with qualitative research comparing experiences of intraoperative radiotherapy and external-beam radiotherapy, where treatment burden, expectations, communication, and patient-centeredness shaped how women experienced radiotherapy (Bagga et al., 2023). The present study reinforces the need for survivorship care that does not end abruptly after radiotherapy completion. Women need anticipatory guidance about expected symptoms, red flags, emotional reactions, self-management, and follow-up pathways so that uncertainty does not become a dominant feature of survivorship.

The results also have implications for treatment personalization and multidisciplinary decision-making. Breast cancer treatment has evolved toward more individualized approaches, including breast-conserving surgery, intraoperative radiotherapy, reconstruction-sensitive radiotherapy planning, and de-escalation where appropriate (Cao et al., 2024; Pantelimon et al., 2025; Vaidya et al., 2021). Quality of life evidence also suggests that primary surgery and treatment modality can influence patient outcomes across different disease contexts (Asghar et al., 2025). In the present study, women's experiences after radiotherapy were shaped by the cumulative treatment pathway rather than radiotherapy alone. This supports the importance of multidisciplinary care in which treatment decisions consider not only tumor control but also fatigue, function, appearance, sexual health, emotional adjustment, family responsibilities, and patient preferences.

The fifth major finding was restored personal agency. Participants reported improved quality of life when they could return to daily roles, practice self-care, accept bodily changes, and redefine normal life. This finding aligns with supportive care literature emphasizing the potential role of lifestyle, exercise, nutrition, rehabilitation, and complementary approaches in helping cancer survivors participate actively in recovery (Benna-Doyle et al., 2026; Vega et al., 2024; Viñolo-Gil et al., 2022). However, the findings also show that agency should not be interpreted as individual responsibility alone. Women's ability to engage in self-care depended on symptom severity, information, family support, financial security, healthcare access, and realistic expectations from others. Older women and women with more complex clinical or social needs may require more comprehensive assessment and individualized survivorship planning (Reid-Agboola et al., 2023). Therefore, restored agency after radiotherapy is best understood as a supported process in which women are enabled to rebuild daily life through coordinated physical, emotional, social, and clinical resources.

5. Conclusion

Overall, the findings support an integrated conceptual understanding of quality of life after radiotherapy. Physical recovery, emotional reconstruction, relational support, healthcare continuity, and restored personal agency were not separate domains but mutually reinforcing aspects of survivorship. Physical symptoms could increase fear, sleep problems could worsen fatigue, poor information could intensify uncertainty, and family support could improve coping. Conversely, inadequate support, persistent symptoms, and unclear follow-up could delay women's return to meaningful activities. This interpretation is consistent with the shift in breast cancer care toward patient-centered survivorship and the recognition that late effects, chronic health problems, and patient-reported outcomes must be addressed as core components of quality cancer care (Faithfull & Greenfield, 2024; Morse et al., 2025; Shamoun & Ahmad, 2025). The present study therefore adds qualitative depth to existing evidence by demonstrating how women themselves perceive and connect the determinants of quality of life after radiotherapy.

6. Limitations & Suggestions

This study had several limitations. First, the sample included 24 women recruited from cancer care settings in Canada, and although purposive sampling with maximum variation was used, the findings may not fully represent the experiences of women from all cultural, linguistic, geographic, socioeconomic, or healthcare contexts. Second, the study relied on self-reported experiences, and participants' accounts may have been influenced by recall, current emotional state, time since treatment, or willingness to discuss sensitive issues such as sexuality, body image, and fear of recurrence. Third, although data saturation was achieved, qualitative findings are interpretive and context-dependent, and the categories identified in this study should be understood as transferable insights rather than statistically generalizable conclusions. Finally, the cross-sectional interview design captured perceptions at one period after radiotherapy and could not fully examine how quality of life determinants change across longer phases of survivorship.

Future research should examine post-radiotherapy quality of life longitudinally to understand how physical symptoms, fear of recurrence, family support, healthcare needs, and personal agency change over time. Further qualitative studies should include more diverse groups of women, including younger survivors, older adults, women living in rural areas, immigrant women, women from different cultural and linguistic backgrounds, and women with varied treatment pathways such as mastectomy, reconstruction, endocrine therapy, or metastatic disease. Mixed-methods studies may also be useful for integrating standardized quality of life measures with in-depth narratives, allowing researchers to compare measured outcomes with the meanings women assign to their recovery. Future intervention studies should also explore whether structured survivorship education, peer support, rehabilitation, sexual health counseling, psychological support, and individualized self-care planning improve quality of life after radiotherapy.

Clinical practice should address post-radiotherapy quality of life as a multidimensional survivorship priority rather than limiting follow-up to disease surveillance and acute toxicity assessment. Healthcare professionals should provide clear information before and after radiotherapy about expected symptoms, fatigue, skin and breast changes, pain, sleep problems, emotional reactions, fear of recurrence, intimacy concerns, and when to seek medical advice. Survivorship care should include routine screening for physical, psychological, relational, and practical needs, with referral pathways for rehabilitation, counseling, lymphedema care, sleep support, sexual health services, nutrition guidance, peer support, and social work when needed. Care teams should also involve family members or partners when appropriate, because women's quality of life is strongly influenced by the understanding and support available in their daily environment. Most importantly, women should be helped to regain a sense of control and confidence after radiotherapy through individualized guidance that validates their ongoing symptoms, supports gradual return to valued roles, and recognizes recovery as a continuing process.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

References

Asghar, Z., Sheikh, Z. M., Sharaf, K., Nadeem, M. A., Ali, S., Mignini, L., & Khan, K. S. (2025). Effect of Primary Surgery on Health-Related Quality of Life in Metastatic Breast Cancer: A Systematic Review of RCT's. *The American Surgeon*, *92*(3), 962-970. https://doi.org/10.1177/00031348251387153

Bagga, S. K., Swiderska, N., Hooker, C., Royle, J., O'Connor, M., Freeney, S., Watson, D., & Woolcock, R. (2023). Qualitative Exploration of Patients' Experiences With Intrabeam Targeted Intraoperative Radiotherapy (TARGIT-IORT) and External-Beam Radiotherapy Treatment (EBRT). https://doi.org/10.1101/2023.09.14.23295478

Benna-Doyle, S., Grant, S., Maunder, A., Liu, J., Ibrahim, M., Cave, A. E., Pandey, C., Tang, M., Koh, E. S., Delaney, G., Bhuyan, D. J., Choi, V., Kwon, K. K., Gonzalez, M., Graham, S., Malalasekera, A., & Ee, C. (2026). The Efficacy and Safety of Nutritional Supplements for Cancer Supportive Care: An Umbrella Review and Hierarchical Evidence Synthesis. *Integrative Cancer Therapies*, *25*. https://doi.org/10.1177/15347354251405267

Blockhuys, S., & Wittung-Stafshede, P. (2024). Yoga as a Complementary Therapy for Cancer Patients: From Clinical Observations to Biochemical Mechanisms. *Complementary Medicine Research*, *31*(5), 403-415. https://doi.org/10.1159/000540213

Bonci, E.-A., Anacleto, J., & Cardoso, M. J. (2023). Sometimes It Is Better to Just Make It Simple. De-Escalation of Oncoplastic and Reconstructive Procedures. *The Breast*, *69*, 265-273. https://doi.org/10.1016/j.breast.2023.03.006

Bu, X., Jin, C., Fan, R., Cheng, A. S. K., Ng, P. H. F., Xia, Y., & Liu, X. (2022). Unmet Needs of 1210 Chinese Breast Cancer Survivors and Associated Factors: A Multicentre Cross-Sectional Study. *BMC Cancer*, *22*(1). https://doi.org/10.1186/s12885-022-09224-w

Büyük, F., Sürel, A. A., Bakırcı, E. Ş., Karakılıç, G. D., Pirinççi, C. Ş., & Borman, P. (2024). Evaluation of the Effect of Accompanying Lymphedema on the Quality of Life and Anxiety Level of Caregivers of Patients With Breast and Genitourinary System Cancers. *Turkish Journal of Physical Medicine and Rehabilitation*, *71*(1), 11-18. https://doi.org/10.5606/tftrd.2024.13279

Cao, S., Wei, Y., Huang, J., Yue, Y., Deng, A., Zeng, H., & Wei, W. (2024). A Bibliometric Worldview of Breast-Conserving Surgery for Breast Cancer From 2013 to 2023. *Frontiers in Oncology*, *14*. https://doi.org/10.3389/fonc.2024.1405351

Chekani, F., Lipschitz, A., & Mensah-Osman, E. (2023). Insomnia in Cancer Patients: A Systematic Literature Review. https://doi.org/10.21203/rs.3.rs-3275728/v1

Cherian, K., Acharya, N. R., Bhargavan, R., Augustine, P., & Krishnan, J. K. (2022). Quality of Life Post Breast Cancer Surgery: Comparison of Breast Conservation Surgery Versus Modified Radical Mastectomy in a Developing Country. *South Asian Journal of Cancer*, *11*(03), 183-189. https://doi.org/10.1055/s-0042-1743420

Crisostomo, B. M. P., & Sugui, R. P. (2022). Health-Related Quality of Life Among Breast Cancer Patients Referred for Radiotherapy During the Covid 19 Pandemic Using a Validated, Culture-Specific Questionnaire. https://doi.org/10.21203/rs.3.rs-2215228/v1

Fairweather, D. S., Taylor, R. M., Allington, L., Fersht, N., Chang, Y. C., & Simões, R. (2024). Do Patient-Reported Outcome Measures (PROMs) Used Within Radiotherapy Clinical Trials Reflect the Impact of Treatment? *Cancers*, *16*(22), 3832. https://doi.org/10.3390/cancers16223832

Faithfull, S., & Greenfield, D. (2024). Cancer Survivor Late-Effects, Chronic Health Problems After Cancer Treatment: What's the Evidence From Population and Registry Data and Where Are the Gaps? *Current Opinion in Supportive and*

Palliative Care, *18*(1), 55-64. https://doi.org/10.1097/spc.0000000000000692

Fearn, N., Llanos, C., Dylke, E. S., Stuart, K., & Kilbreath, S. L. (2022). Quantification of Breast Lymphoedema Following Conservative Breast Cancer Treatment: A Systematic Review. *Journal of Cancer Survivorship*, *17*(6), 1669-1687. https://doi.org/10.1007/s11764-022-01278-w

Giron, P. S., Haddad, C. A. S., Samantha Karlla Lopes de Almeida, R., Elias, S., Nazário, A., & Facina, G. (2025). Effect of Exercise Therapy, Systemic Acupuncture and Silicon Oxide Tablets on Muscular Strength, Lymphedema, and Quality of Life in Breast Cancer Survivors: Randomized Clinical Trial. *Asian Pacific Journal of Cancer Prevention*, *26*(3), 799-808. https://doi.org/10.31557/apjcp.2025.26.3.799

Goerge, A., Sanderson, M., Flewellen, C., Busen, K., & Nechuta, S. (2023). The Role of Spirituality on Physical Activity and Sleep Among African American Long-Term Breast Cancer Survivors. *Journal of Racial and Ethnic Health Disparities*, *11*(6), 3379-3389. https://doi.org/10.1007/s40615-023-01791-3

Graham, J. M. (2024). Breast Cancer: The Psychological Impact of Diagnosis, Treatment, and Remission. *Cureus*. https://doi.org/10.7759/cureus.70814

Gupta, B., Gupta, K., Narula, K., Sharma, P., & Mittal, A. (2025). The Effect of Exercise on Quality of Life Among Patients and Survivors of Breast Cancer: A Systematic Review and Meta-Analysis. *Asian Pacific Journal of Cancer Prevention*, *26*(3), 715-723. https://doi.org/10.31557/apjcp.2025.26.3.715

Hao, S., Hou, J., Zhang, L., Zhou, C., Hou, Y., Yu, K. D., Hu, Z., Liu, G., Di, G. H., Shao, Z. M., Yu, X., & Wu, J. (2025). Protocol for a Multicentre, Prospective, Open-Label, Randomised Controlled Trial to Compare PROs and Safety Outcomes Between Preoperative and Postmastectomy Radiotherapy in Locally Advanced Breast Cancer Patients With Immediate Reconstruction via a Deep Inferior Epigastric Perforator Flap (CAPPELLA) in China. *BMJ open*, *15*(1), e086980. https://doi.org/10.1136/bmjopen-2024-086980

Iliescu, M. G., Stanciu, L.-E., Uzun, A.-B., Cristea, A.-E., Motoașcă, I., Irsay, L., Iliescu, D., Vari, T., Ciubean, A. D., Caraban, B. M., Ciufu, N., Azis, O., & Ciortea, V. M. (2024). Assessment of Integrative Therapeutic Methods for Improving the Quality of Life and Functioning in Cancer Patients—A Systematic Review. *Journal of clinical medicine*, *13*(5), 1190. https://doi.org/10.3390/jcm13051190

Keelan, S., Flanagan, M., & Hill, A. D. (2021). Evolving Trends in Surgical Management of Breast Cancer: An Analysis of 30 Years of Practice Changing Papers. *Frontiers in Oncology*, *11*. https://doi.org/10.3389/fonc.2021.622621

Lee, A., Kwasnicki, R. M., Khan, H., Grant, Y., Chan, A., Fanshawe, A., & Leff, D. (2021). Outcome Reporting in Therapeutic Mammaplasty: A Systematic Review. *BJS Open*, *5*(6). https://doi.org/10.1093/bjsopen/zrab126

McGee, S. F., Clemons, M., Pond, G. R., Caudrelier, J.-M., Liu, M., Alzahrani, M., Ng, T. L., Awan, A., Sehdev, S., Hilton, J., Savard, M.-F., Fallowfield, L., Kumar, V., Freedman, O., Vandermeer, L., Hutton, B., & Bourque, J. M. (2024). A Randomized Trial Comparing Concurrent Versus Sequential Radiation and Endocrine Therapy in Early-Stage, Hormone-Responsive Breast Cancer. *Current Oncology*, *31*(8), 4531-4545. https://doi.org/10.3390/curroncol31080338

Misiąg, W., Piszczyk, A., Szymańska–Chabowska, A., & Chabowski, M. (2022). Physical Activity and Cancer Care—A Review. *Cancers*, *14*(17), 4154. https://doi.org/10.3390/cancers14174154

Morse, R., Bean, N. W., Hall, J., Deal, A. M., Nyrop, K. A., Abdou, Y., Dees, E. C., Ray, E. M., Jolly, T. A., Reeder-Hayes, K. E., Jones, E., Gupta, G. P., Elmore, S. N., Muss, H. B., & Casey, D. L. (2025). Quality of Life Outcomes in Breast Cancer Patients Receiving Chemotherapy With or Without Radiation Therapy. *Clinical Breast Cancer*, *25*(1), e86-e93. https://doi.org/10.1016/j.clbc.2024.08.015

Muthanna, F. M. S., Hassan, B. A. R., Karuppannan, M., Ibrahim, H. K., Mohammed, A. H., & Abdulrahman, E. (2023). Prevalence and Impact of Fatigue on Quality of Life (QOL) of Cancer Patients Undergoing Chemotherapy: A Systematic Review and Meta-Analysis. *Asian Pacific Journal of Cancer Prevention*, *24*(3), 769-781. https://doi.org/10.31557/apjcp.2023.24.3.769

Noëlle, J. M. C. V. P., Kaplan, R. Z., Clarijs, M. E., Mureau, M. A., Verhoef, C., Dalen, T. v., Husson, O., & Koppert, L. B. (2023). Quality of Life After Different Axillary Treatments in Women With Breast Cancer: A Longitudinal Cohort Study. https://doi.org/10.21203/rs.3.rs-2984196/v1

Noëlle, J. M. C. V. P., Vlooswijk, C., Bijlsma, R. M., Kaal, S. E. J., Kerst, J. M., Tromp, J. M., Bos, M. E., Hulle, T. v. d., Lalisang, R. I., Nuver, J., Kouwenhoven, M. C., Iris, M. C. v. d. P., Winette, T. A. v. d. G., & Husson, O. (2024). Sexual Quality of Life of Adolescents and Young Adult Breast Cancer Survivors. *Esmo Open*, *9*(2), 102234. https://doi.org/10.1016/j.esmoop.2024.102234

Pantelimon, I., Stancu, A. M., Coniac, S., Ionescu, A.-I., Atasiei, D.-I., Georgescu, D., & Galeş, L. (2025). Local Control of Advanced Breast Cancer—Debate in Multidisciplinary Tumor Board. *Journal of clinical medicine*, *14*(2), 510. https://doi.org/10.3390/jcm14020510

Reid-Agboola, C., Klukowska, A. M., Malcolm, F. L., Harrison, C., Parks, R., & Cheung, K. L. (2023). Comprehensive Geriatric Assessment for Older Women With Early-Stage (Non-Metastatic) Breast Cancer—An Updated Systematic Review of the Literature. *Current Oncology*, *30*(9), 8294-8309. https://doi.org/10.3390/curroncol30090602

Samela, T., Bartoletti, R., Antinone, V., Aloisi, D., Papanikolaou, E. S., Quintavalle, C., Galitiis, F. D., Abeni, D., & Marchetti, P. (2022). Cross-Cultural Adaptation and Preliminary Validation of Upper Limb Lymphedema Quality of Life Questionnaire (ULL-27) in Italian Female Patients With Breast Cancer-Related Lymphedema. *Lymphatic Research and Biology*, *20*(6), 651-658. https://doi.org/10.1089/lrb.2021.0080

Seneviratne, S., Wijayalathge, H., Peiris, K., Gunasekara, S. T., & Wijeratne, T. (2022). Post-Treatment Quality of Life Among Sri Lankan Women With Breast Cancer. *European Journal of Cancer*, *175*, S55. https://doi.org/10.1016/s0959-8049(22)01496-4

Setiawan, H., Ariyanto, H., Khaerunnisa, R. N., Firdaus, F. A., & Fitriani, A. (2021). Yoga Improves Quality of Life Among Breast Cancer Patients. *Faletehan Health Journal*, *8*(01), 1-9. https://doi.org/10.33746/fhj.v8i01.159

Shamoun, S., & Ahmad, M. (2025). Enhancing Quality of Life: The Effect of Complete Decongestive Therapy on Jordanian Women With Breast Cancer After Axillary Lymph Node Dissection. *European Journal of Breast Health*. https://doi.org/10.4274/ejbh.galenos.2025.2024-12-11

Vaidya, J. S., Bulsara, M., Baum, M., Tobias, J., Wenz, F., Massarut, S., Pigorsch, S., Alvarado, M., Douek, M., Saunders, C., Flyger, H., Eiermann, W., Brew-Graves, C., Williams, N., Potyka, I., Roberts, N., Bernstein, M., Brown, D., Sperk, E., . . . Joseph, D. (2021). Single-Dose Intraoperative Radiotherapy During Lumpectomy for Breast Cancer: An Innovative Patient-Centred Treatment. *British Journal of Cancer*, *124*(9), 1469-1474. https://doi.org/10.1038/s41416-020-01233-5

Vega, C., Barnafi, E., Sánchez, C., Acevedo, F., Walbaum, B., Parada, A., Rivas, N., & Merino, T. (2024). Calorie Restriction and Time-Restricted Feeding: Effective Interventions in Overweight or Obese Patients Undergoing Radiotherapy Treatment With Curative Intent for Cancer. *Nutrients*, *16*(4), 477. https://doi.org/10.3390/nu16040477

Viñolo-Gil, M. J., Martín-Valero, R., Martín-Vega, F. J., Rodríguez-Huguet, M., Pérez-Cabezas, V., & González-Medina, G. (2022). Respiratory Physiotherapy Intervention Strategies in the Sequelae of Breast Cancer Treatment: A Systematic Review. *International journal of environmental research and public health*, *19*(7), 3800. https://doi.org/10.3390/ijerph19073800